



**RAPID DRYING OF CERAMICS
REDUCING ENERGY CONSUMPTION
AND CO₂ EMISSIONS
WHILE PRESERVING
PRODUCT QUALITY**

NEW RAPID DRY SOFTWARE

INTRODUCTION

Sanitaryware drying is a very important production step in which not chemically bonded water is removed from the body.

Air is used as a means to heat and remove water, so it is fundamental to check its properties, such as:

- temperature
- relative humidity
- speed.

A non-homogeneous drying process causes differential shrinkages inside the ceramic piece. This produces internal tensions that can exceed the raw mechanical resistance and cause cracks.



THE NEW SOFTWARE

In the Rapid Dry project, SE.TE.C developed a new software that allows to optimize and regulate the main parameters affecting the drying process.

Thanks to this new device, it is now possible:

- to set a real drying curve with the possibility to choose and maintain temperature and humidity for every drying step.
- to regulate the internal moisture through the injection of finely atomized water
- to choose the desired air turbulence for every drying step and in this way to accelerate/decelerate the drying process based on the customer's needs
- to manage in a fully automated way the heat generator and the air fans: the thermal and electrical power are, in every moment, just what you need
- to manage humidity extractions and heat recovery in a completely automatic way.

FINAL RESULTS

- Fully automated controllable drying process.
- Drying cycle lower than 8 hours.
- The thermal consumption is only 98 Kcal/kg with respect to the 288 Kcal/kg of traditional dryers.
- The electrical consumption is only 0.003 kWh/kg with respect to 0.019 kWh/kg of traditional dryers.

These incredible energy savings are achievable thanks to several new technologies that are fully controlled by the innovative software and allow for a very fast drying cycle.



PROJECT DESCRIPTION

Rapid Dry project will develop an innovative fully automated chamber dryer that reduces energy consumption, and new slips formulations (fire clay and vitreous china) to optimise the drying curve and to include the use of recycled raw materials, reducing resource consumption. The combined application of the proposed technologies has the potential to significantly reduce production costs.

The ceramic body's drying process is used for sanitaryware, refractory ceramics and smaller production of tableware. Usually, water is used for a thorough mixing of raw materials and shaping of ceramic bodies, and must then be evaporated in dryers before placement in the firing kiln.

A close relationship exists between drying, the particle size of the body and the mineralogical composition. One of the best ways to optimise drying is to modify the slips, and this is why the project focuses not only on the development of an innovative dryer but also on the optimization of slips formulations.

Ceramic non-tiles production includes about 60-70% of the entire ceramic manufacturing and accounts for about 25-30% of CO₂ emissions. Thus, the implementation of the proposed technology would have a transformative effect on the sustainability of the European ceramic sector.

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